Motives and Concerns of Dashcam Video Sharing

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Dashcam Overview



Dashcam (Dashboard Camera, Blackbox):

An onboard camera that continuously records the view (through a vehicle's windscreen), audio, and GPS (optional)

Dashcam Overview

Dashcam Popularity in Korea



2013

2015

[Top Rider. 2015. Research on Vehicle Blackbox]

https://www.top-rider.com:447/news/articleView.html?idxno=19493

Dashcam Overview | A common way to find witnesses



Looking for witnesses to a car accident!!

12 July, 2013. 21:10pm, Looking for someone who witnessed a car accident of a silver car and a black car at the crossroad in Pankyo-dong

Please contact to Bundang Police center 031-786-XXXX

Dashcam Overview | An emerging way to find evidence

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Dashcam video sharing via online communities

University online community
Car-related online community

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Research Goal



To identify the key *motives* and *concerns* behind the sharing of dashcam videos (dashcam-based crowdsourcing)

Motivation for participation in online activities

- Motivations for crowdsourcing tasks [Kaufmann, 2011; Raban, 2008]
 - Intrinsic factors (e.g., enjoyment, feeling good, point)
 - extrinsic factors (e.g., monetary rewards)
- Motivations for knowledge sharing in social Q&A [Nam, 2009]
- Motivations for voluntary geographic mapping (OpenStreetMap)

[Budhathoki and Hathornthwaite, 2013]

Privacy concerns of personal information sharing

- Privacy sensitivity of various personal information types (in e-commerce environments) [Ackerman, 1999]

- Factors affecting willingness to disclose location information (who, why, what) [Consolvo, 2005]
- Organization's personal information management practice: collection, unauthorized secondary use, improper access, errors in personal data [Smith, 1996]

Privacy studies on pervasive surveillance (video/IoT devices)

- Information privacy concerns in video recording (e.g., CCTV) [Nguyen et al, 2011] : Privacy concerns for data collection were lower than concerns for improper access and secondary use
- Privacy concerns with sensing & recording in a smart home [Choe et al, 2011] : Types of privacy concerning activities in a private place
- Privacy concerns with wearable cameras (e.g., SenseCam, Google Glasses) [Nguyen et al., 2009]
- : Privacy concerns are nuanced in relation to the major contextual factors
- Privacy concerns with vehicle-based sensing/recording [Sleeper et al, 2015] : Affecting mental models of recording awareness due to mobility and coverage

Methods

STUDY 1: Open ended questions to understand dashcam usage

- Usage purpose of dashcam
- Sharing motives
- Sharing concerns

STUDY 2: Survey questionnaire based on the result of STUDY 1

- Respondents' motivations for participation
- Privacy attitudes and other related concerns

STUDY 1 - Method

STUDY1: Online Survey (N=108)

In open ended questions we asked,

- Usage Purpose
 - Why do you use dashcam?
- Sharing motives
 - What would you expect if you share your dashcam video?"
- Sharing concerns
 - What would you concern if you share your dashcam videos?

Categorized all survey responses w/ affinity diagramming

Usage Purposes of Dashcam

-Major themes: to secure evidence for traffic-related accidents/incident (93.5%)

- 66 Not only I can use dashcam footage as an evidence to accident, I can also feel sense of relief by installing dashcam.
- -Minor themes: insurance discount, etc.
 - My Insurance companies offer a discount on insurance premiums for having a dashcam.

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- To reciprocate
- To do right for public good and social justice
- To receive a monetary reward

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
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- To receive a monetary reward

We need to help if there is someone who really need the dashcam video and sharing the video can solve his/her the unjust situation.

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- To reciprocate
- To do right for public good and social justice
- To receive a monetary reward

If I can help other people by sharing my footage, I am more than happy to share

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people

- To reciprocate

- To do right for public good and social justice
- To receive a monetary reward

66 I always try to help because I also can request dashcam video someday.

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- To reciprocate
- To do right for public good and social justice
- To receive a monetary reward

66 I would share my dashcam video
for social justice.

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- To reciprocate
- To do right for public good and social justice
- To receive a monetary reward

66 I would only share my dashcam footage if there is a financial reward.

Sharing Concern Themes

- Privacy Sensitivity
- Requester's Trustworthiness
- Data Management

Sharing Concern Themes

-Privacy Sensitivity

- Recorded audio
- Video content with traffic violation
- Bystander privacy
- Passenger identities
- Driving routes (GPS)
- Video content without traffic violation

If the footage I am about to share includes a phone call with my co-worker discussing a company's confidential information, I might get in trouble for sharing.

Sharing Concern Themes

-Privacy Sensitivity

-Requester's Trustworthiness

- Police
- Accident involved party
- Insurance company

66 I am reluctant to share my dashcam footage with insurance companies since they would only care about making profit out of the situation.

Sharing Concern Themes

- -Privacy Sensitivity
- -Requester's Trustworthiness

-Data Management

- Non-disposal of shared data
- Identity exposure

- Retaliation
- Misuse of shared locations

- Misuse of shared videos

You never know if your shared footage was properly disposed or spread to other people, unless there are strict regulations.

STUDY 2 – Method

STUDY2: Online Survey (N=373)

- In a 7-point Likert-scale questionnaire,
- Sharing motives
 - 3 social justice items
 - 3 altruism items
 - 3 reciprocity items
 - 3 monetary reward items
- Sharing concerns
 - 6 privacy sensitivity items
 - 5 data management items
 - 3 trustworthiness items

The items were selected based on the explorative study (Study 1) and literature review results for statistical analysis

Sharing Motive Themes

- To determine the truth and resolve unjust accusation
- To help other people
- To reciprocate
- To do right for public good and social justice
- To receive a monetary reward





:The concept in which people are willing to risk their own welfare to ensure that others are treated fairly.

- I share my dashcam footages to achieve social justice.
- Sharing dashcam footages helps to achieve justice in society.
- If sharing my video footages can resolve an unjust accusation or a wrong treatment, I will actively help victims.



:A behavior performed without expecting any future reward and

- I shace myet sout mainly to benefit others are in need of videos will use my contribution.
- It is important to help others by providing dashcam footage without expecting anything in return.
- I expect dashcam users to actively share dashcam footages without expecting anything in [Budhathoki, 2010]



:Social rule that says people give back the kind of treatment they

- I exphave/received from panotheit's only fair for me to help them by sharing my dashcam footage.
- I will actively share my dashcam footages to help others, if I was helped by others dashcam footage.
- If I receive dashcam footages from other people, I should share my footages with others in [Cho, 2010]



:Financial payment for something good that has been done ward

- I need financial benefits to share my dashcam footages.
- I will share dashcam footages to make financial profits.
- I will make financial profits by sharing dashcam footages.

[Budhathoki, 2010]



To find underlying factors by clustering the questions

STUDY 2 – Result | Sharing Motives

Subscales	Motivation	Factor Loading	Mean	SD
	Factor 1: Reciprocal altruism & Social justice (Cronbach's alpha =.878)		5.82	0.92
Social justice	I share my dashcam footages to achieve social justice.	.804	5.75	1.29
Altruism	I share my dashcam footage because those who are in need of videos will use my contribution.	.798	5.81	1.23
Social Justice	Sharing dashcam footages helps to achieve justice in society.	.774	5.78	1.31
Reciprocity	I expect other people to help me, so it's only fair for me to help them by sharing my dashcam footage.	.754	5.46	1.50
Reciprocity	If will actively share my dashcam footages to help others, if I was helped by others' dashcam footages.	.752	6.27	0.99
Reciprocity	If I receive dashcam footages from other people, I should share my footages with others in return.	.661	5.86	1.30
Altruism	It is important to help others by providing dashcam footage without expecting anything in return.	.621	5.66	1.36
Social justice	If sharing my video footages can resolve an unjust accusation or a wrong treatment, I will actively help victims.	.616	6.48	0.82
Altruism	I expect dashcam users to actively contribute answers without expecting anything in return.	.611	5.31	1.57
	Factor 2: Monetary reward (Cronbach's alpha =.897)		2.78	1.50
Monetary reward	I need financial benefits to share my dashcam footages.	.919	2.64	1.60
Monetary reward	I will share dashcam footages to make financial profits.	.907	2.77	1.69
Monetary reward	I will make financial profits by sharing dashcam footages.	.870	2.95	1.66

STUDY 2 – Result | Sharing Motives





Factor 1: "Reciprocal Altruism & Social Justice"

Factor 2: "Monetary Reward" (Mean=2.78, SD=1.50)



Privacy Sensitivity

Data Management

Requesters' Trustworthiness Motive Difference across Different Privacy Groups



Privacy Sensitivity

Recorded audio

Video content with traffic violation

Bystander privacy

Passenger Identities

Driving routes (GPS)

Video content without traffic violation





Privacy Sensitivity

Created by Gregor Cress from the Noun Project

Recorded audio				- M=4	4.97	
Video content with traffic violation				- M=4	4.50	
Bystander privacy				M=4	4.48	
Passenger Identities				M=4.24		
Driving routes (GPS)			M=3.89	9		
Video content without traffic violation			M=3.5	5		
	1	2	3	4 5	5 6	5 7



Created by DesignNe from Noun Project





Created by DesignNe from Noun Project

Non-disposal of shared data		M=5.34					
Misuse of shared videos					M=5	.21	
Identity exposure			M=5	.17			
Retaliation					M=4.88		
Misuse of shared locations					M=4.83		
	1	2	3	4	5	6	7


Police

Accident involved party

Insurance company





Police		M	=3.01				\neg
Accident involved party	M=2.86						
Insurance company	M=2.74						
	1 2	2	3	4	5	6	7



Group		Level of privacy concerned (based on their privacy concern point)
Fundamentalist	(28.4%)	High privacy concerned
Pragmatist	(50.9%)	Medium privacy concerned
Unconcerned	(20.6%)	Low privacy concerned

*Clustred using K-mean algorithm based on respondents' privacy concern points





Groups with high privacy concerns

had lower reciprocal altruism and social justice score



Groups with high privacy concerns had higher monetary score



Reciprocal Altruism & Social Justice Monetary Reward

Motivation difference

- Reciprocity, altruism, and social justice are much stronger
- Skill mastery, fun motives are not found

Privacy concerns types

- Audio and video content with traffic violation are highly concerned
- Requesters' identity (e.g., bystanders, passengers)

Motivation and concerns

- Motivational difference across difference privacy concern groups
- No significant differences between motivation/concern and demographic information (e.g., gender, age)

Discussion | **Design** Implication

Encouraging Motivation for Sharing

• To highlight reciprocal altruism and social justice aspects

Discussion | **Design** Implication





- Clipping a relevant part from a recorded video
- Removing audio tracks (mute)
- Removing sensor data (e.g., GPS)

Discussion | **Design** Implication





Providing clear privacy management guideline

Limitation & Future Work



The online surveys were conducted in Korea. We are currently working on cultural difference in dashcam video sharing (e.g., in Russia, China, Japan)



As our work is based on only online surveys, a field study with real dashcam users is required to uncover various contextual factors affecting dashcam video sharing

Thank you



Motives and Concerns of Dashcam Video Sharing

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